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GYRATING ACOUSTICAL BEARING BRACKET

BACKGROUND

[0001] 1. Technical Field

[0002] The present invention relates to acoustical speaker brackets and systems.

[0003] 2. Background Information

[0004] Since the first speaker invention, innovative designs have been made to maximize sound reproduction. In the 1920's, Chester W. Rice and Edward Washburn patented a new prominent design for speakers that incorporated the moving coil and direct radiator. The speakers were sold to the public under the trade name "Radiola". In its time, its sound reproduction quality was superior to anything previously invented. The unique design lessened distortion and enhanced audio quality.

[0005] Other exemplary designs have been made including subwoofers, woofers, tweeters, and midrange speakers. Other improvements have included better cooling designs, improved magnets, higher wattage handling, and stronger, more rigid materials. These combinations in the field have enabled higher fidelity audio reproduction and listening pleasures.

[0006] The history of ball bearings is relevant to the present background. Many dramatic advances have been accomplished throughout history on the ball bearing. Different ball bearings have been designed to accomplish many different tasks. Weight, rotations per minute ("RPM"), and lubrication, have all been precisely engineered to accomplish many tasks.

[0007] The Ball bearing too has evolved. In 1844 the invention of BALL-BEARING wheels made these two contraptions glide easier causing little to no friction. Since Sven Wingquist created the self-aligning ball bearing in

1907, worldwide, new developments in use, and various applications can be employed.

[0008] U. S. Patent Number 6,374,942 to Huggins, describes a system for a combined rotatable and electrical speaker mounting system. This system allows the positioning and re-positioning of a speaker system with full rotational motion of the speaker to direct aim without severing the electrical connection. Huggins speaker assembly is configured for a speaker that suffers from directionality and sound distance attenuation limitations. Huggins speaker assembly is configured with a mechanical mounting mechanism and configured to establish an electrical connection between the speaker and the enclosure. Although Huggins speaker system allows rotation, its rotation is based on fixture like enclosure that is manually rotated and locked to better disburse sounds downward in home audio systems. His invention also consists of cylindrical members configured to axially and concentrically couple with one another. This allows the speaker to have a full range of motion, i.e. when adjusted by user with respect to the enclosure to be adjusted without using tools to disassemble and rewire the system. But this system is complex and cannot be adapted quickly into an existing car audio speaker system, especially with off the shelf components. The Huggins speaker apparatus also allows for full directional aiming of the speaker due to the electrical connections and the mechanical connections being independent.

BRIEF SUMMARY

[0009] An advance is made in the field of acoustical speakers by a gyrating acoustical bearing bracket. The presently disclosed device includes bearing rings designed to mount between an acoustical sound speaker and an enclosure or other structure. This configuration allows the acoustical sound speaker to use kinetic energy to gyrate freely. The present invention is ideally

suited for use with a stereo or as an add-on unit or in a pre-installed setup. Each bracket can accommodate one or more speakers depending on the bracket's interior diameter (I.D. - see drawing I) size and the speaker's exterior diameter (E.D. - see drawing I) size. Each bracket can be used solely or as a multi-setup display or a combination of multiple setups and adjoining configurations for speakers.

[0010] In one embodiment, the brackets are placed in an enclosure adapted and configured for that particular speaker system where number in volume sizes, port sizes, recessed and or channelized designs, have already been pre-configured.

[0011] The gyrating bracket shape is well-suited to almost any existing speaker container or enclosure. The Interior Diameter ("I.D.") of the bracket is sized so that it is compatible with a wide variety of standard-sized speaker systems. When the exterior diameter of a speaker is a little bigger than the interior diameter (I.D. – see drawings I) of the bracket, this allows firm bracketing to the enclosure allowing adequate suspension for the excess loads of a moving and thereby vibrating speaker.

[0012] The gyrating brackets further provide an enhanced speaker functionality effect that prior or typical rigid adaptation did not provide. This is accomplished by allowing the speaker to gyrate freely. Free gyrating functionality disallows any suppression encompassed by rigid brackets therefore improving acoustic presence or performance.

[0013] The presently disclosed brackets can perform with an acoustic replicator of any design bracketed within the circular ring having an interior diameter (I.D. – see drawing I) of the same or smaller inner bracket, facing away at one end and which then is secured inside another circular ring separated by bearings, which is then bracketed on a cabinet enclosure via any fastening device. The inner circular ring bears another opening, which is

used to house a speaker unit(s). This opening typically resembles a circular form, but can be configured to any shape or form to co-exist on any irregular manufactured speaker system.

[0014] The exterior surface of the inner circular ring contains a notch running parallel to the face of the ring or circumscribed along its outer diameter. This notch allows a channelized path for the bearing to glide around its perimeter. Another notch is placed on the surface of the outer circular ring running parallel to the perimeter of the ring or inscribed along its inner diameter. Again this notch allows free play between outer interior bracket and the exterior bracket. The outer circular ring, brackets to a cabinet (or any variation) enclosure via any fastening device. When completely installed the structure provides the speaker with automatic gyrating swings along its axis when the speaker is in use. More variable rotations may be achieved by applying more power to the system via amplifier or stereo outputs/inputs.

[0015] The present invention discloses attachable bearing slip apparatus, which can be used on all pre-existing speaker systems. This bearing slip apparatus can be configured for new modules, to reproduce an automatic variable rotational effect. Therefore already using provided, or thus to be provided, power consumption for acoustical device.

[0016] The present invention enhances aesthetics and visual looks of speaker equipment. This is because the present invention provides life-like dance motions, which occur on a rhythmic manner as music is played.

[0017] The present invention is further facilitates installation by its compatibility to all existing systems. Any existing speaker cabinets or enclosures can be fitted to the brackets for the present invention, and thereby converted to a self-spinning acoustical system.

[0018] Another distinction in these brackets is to develop in uncomplicated systems that maximize a low frictional apparatus to execute known

gravitational variables. Thus foremost solely rely on stereo outputs / inputs and environmental gravitational changes to gyrate the speaker unit.

[0019] Manufacturing the present invention is simple due to its simple, and well used (in other applications) bearing brackets as one of its comprised components, which makes it an inexpensive add on device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 illustrates a front view of a bearing bracket of one embodiment of the present invention.

[0021] FIG. 2 illustrates a cross sectional side view of FIG. 1 of one embodiment of the present invention.

[0022] FIG. 3 illustrates a zoom in (close-up) view of FIG. 1 having a shaded surface representation of one embodiment of the present invention.

[0023] FIG. 4 illustrates a zoom in (close-up) view of FIG. 1 encompassing all hidden elements that can be seen from the rear view displayed from the front view of a surface scan of one embodiment of the present invention.

[0024] FIG. 5 illustrates an isometric representation of the speaker module to be encompassed in bearing bracket of one embodiment of the present invention.

[0025] FIG. 6 illustrates an isometric representation the bearing bracket apparatus that houses the speaker and mounts to the enclosure of one embodiment of the present invention.

[0026] FIG. 7 illustrates an isometric representation of a zoom in (close-up) view of FIG. 6 detailing the bearing and bracket configuration of one embodiment of the present invention.

[0027] FIG. 8 illustrates an isometric representation of both the speaker and bearing brackets assemblies of one embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS AND THE PRESENTLY PREFERRED EMBODIMENTS

[0028] The invention is described with reference to the drawings in which like elements are referred to by like numerals. The relationship and functioning of the various elements of this invention are better understood by the following detailed description. However, the embodiments of this invention as described below are by way of example only, and the invention is not limited to the embodiments illustrated in the drawings. It should also be understood that the drawings are not to scale and in certain instances details have been omitted, which are not necessary for an understanding of the present invention, such as conventional details of fabrication and assembly.

[0029] The "Gyrating Acoustical Ball Bearing" as described uses a combination of modern innovations to achieve and optimize its use. The method used to achieve this rotation is bearing brackets. The bearing brackets can be applied to any existing speaker device. These brackets, since they contain bearings, both cylindrical or ball bearing, or a combination thereof can provide a low-friction environment for a speaker to gyrate while being played or in a rest state position, on its or axis or bracket ring. The existing device provides for quick setup and compatibility with many acoustic suspension systems or bass reflex speaker systems. Any of these enclosures are compatible with the present invention. Thus the gyrating speaker apparatus adds free movement without interfering with calculated specifications for a sound system. The resulting structure provides a higher efficiency in movement without depreciation in quality caused by steady bracing of the speaker.

[0030] The brackets provide enhanced aesthetics and efficiency as the brackets gyrate. This produces enhanced vocal ambiance and a multi-directional flow of acoustics. Agitation by more power being added to the

speaker system will aid in its 360-degree self-rotation. This creates more rapid rotation using kinetic energy generated by the speaker. This device can be used especially in smaller environments (ex. Automotive) where a multi-timbrel effect as well as aesthetically pleasing setup is desirable in a limited space.

[0031] Turning now to the Figures, FIG. 1 shows a bracket assembly of having two circular rings surrounded by bearings, and in particular, outer circular ring **1**, and the inner circular ring **2**. The outer circular ring **1** has screw hole **3** that goes through the body allowing firm installation on to the enclosure. The inner circular ring **2** also has the has screw hole **4** that goes through the body allowing firm installation of the speaker device (shown in FIG. 5) to the inner ring **2**. This is made possible by the opening in **5** that is placed within the inner ring **2**. The opening in this figure is of the form of a circular diameter but can be any irregular or polygonal shape needed to encompass the acoustic replicator.

[0032] An alternate configuration can be achieved where the ring **1** can also be mounted behind ring **2**, mirroring the entire internal assembly from an interior configuration to a rear arrangement. This would imply that the channelized pathway **4**,**6** illustrated in FIG. 7 would now be shifted to back **5** of bracket shown in FIG. 7. Also, in this embodiment, ball bearing **2** and interior ring **1** of FIG. 7 would be placed to back of outer bracket **5** of FIG. 7.

[0033] It is not necessary in the design of the invention that the hole **5** within the inner ring or the speaker be round, nor is it necessary that the inner circle of the inner ring house one speaker. Thus an alternate version is possible in which more than one speaker can be used in the internal ring as a multiple speaker combination or multiple speaker sizes.

[0034] FIG. 2 shows the cross sectional view of the assembly of the two rings by means of the two circular rings with bearings. The outer cross

sectional view or exterior diameter **1** (E.D.) can be clearly seen on top of the interior ring having an interior diameter (I.D.) **2**. They are separated by bearings **5** arranged in chanels **2** and **3** (as illustrated in FIG. 4). The diameter of the outer ring **1** is calculated after the inner ring **2** is known. The inner ring **6** is calculated after the speaker size is anticipated allowing additional space for the mounting screws and nuts. The bracket width **3** can be calculated after knowing the devices wattage and power handling capacity. A one-inch width will over accommodate an average subwoofer system, but will need adjustment to accommodate different handling loads, as will become apparent to a person of ordinary skill in the art in view of the present disclosure.

[0035] FIG. 3 shows a surface view zoom in section of FIG. 1 callout **6**. In particular, FIG. 3 shows the outer circular ring **1** and the inner circular ring **2**. The outer circular ring **1** has screw hole **3** that goes through the body allowing firm installation to the enclosure. The inner circular ring **2** also has the screw hole **4** that goes through the body allowing firm installation of the speaker device of FIG. 5 to the inner ring **2**.

[0036] FIG. 4 shows a hidden surface view zoom in section of FIG. 1 callout (6). This zoom in area shows the hidden channelized guides that align the bearings **1** between the inner channel **3** and the outer channel **2**, providing a smooth friction less movement between the two entities.

[0037] Bearing **1** size will directly relate to weight of speaker unit and system vibration foreseen that the outputs will reproduced. Total speaker wattage and load capacity will dictate a stretching of exterior diameter FIG. 2 callout (**1**), along with channelized areas **2,3** to increasing and accommodate larger more robust bearings **1**.

[0038] Bearing 1 quantity can be increased to also aid in the structural support and integrity needed to bind components securely.

[0039] A wide variety of bearings can be used with the present bearing brackets. This includes cylindrical bearings, angular bearings that are formed from metal, plastic, or other synthetic materials. Any type or variation plus combination thereof can be substituted or implemented in this design. This includes metal ball bearings, plastic ball bearings, linear ball bearings, needle roller bearings, thrust bearings, pressed bearings, Y-Bearings, angular ball bearings, CARB toroidal roller bearings, spherical roller bearings, taper roller bearings, or other bearings that will become apparent to a person of ordinary skill in the art in view of the present disclosure.

[0040] FIG. 5 depicts an acoustical replicator, also referred to as a speaker module with various hole's **1** around the outer perimeter of the speaker. These allow firm bracketing on the interior bracket FIG. 6 callout (**2**) by nut and bolt assembly.

[0041] Speaker adaptation can vary from circle diameter modules, rectangular modules, triangular modules, and polygonal modules.

[0042] Speaker types can be retrofitted, from subwoofer assemblies to woofer assemblies, and or any other speaker console therefore.

[0043] Turning to FIG. 6, showing a complete bracket assembly comprised of all entities less speaker FIG. 5. The internal ring **2** is preferably a plastic or synthetic material, but can be modified per custom specification, which houses the speaker unit FIG. 5. A speaker unit fits on front plane of said internal ring. Internal ring bears holes **5** that align with speaker holes **1** of FIG. **5**. With these aligned a nut and bolt assembly can be accepted from face plane of speaker FIG. 5 through internal ring 5. The nut and bolt assembly will slip through holes **1** (shown in FIG. 5) and enter holes on inner ring **5**. The nut will attach to bolt on the rear plane for ridged and firm placement on inner ring **2** front plane. After speaker unit FIG. 5 is in place, inner ring is surrounded by ball bearings **3**. The ball bearings are provided in channelized

notches **4**, **6** of FIG. 7 along the outer perimeter of inner ring **2**. Ball bearings **3** then fit along another channelized path along inner perimeter of outer ring **1**. Outer ring **1** is preferably a plastic or synthetic material but can be modified per custom specification. This housing is utilized to allow interior speaker to move based on its own kinetic energy generated by sound input /output. Outer ring **1** is firmly mounted with nut and bolt assembly or screw type attachment to the enclosure. Interior ring **2** and speaker unit FIG. 5 can sustain suspension by exploiting ball bearings **3** which are in channels 2, 3 of FIG. 4 for support. This makes interior ring **2** operate on variable gyrating axis when power is applied to speaker.

[0044] FIG. 7 shows a zoom in area **6** of FIG. 6 to better described the channelized interaction. Interior ring **1** is shown with channelized notch **4** where bearing **2** sits in a confined compartment. Beneath this arrangement lays outer ring **3**, which also have a channelized notch **6**, which then confines bearings **2** to stay aligned, and allows inner ring **1** to move freely.

[0045] The zoomed-in depiction of FIG. 7 allows a clearer view of how parts interact. Of course, individual components can be rearranged to work in a like manner. For example, channelized notches **4**, **6** of FIG. 7 can be moved to different planes of the bracket. For example channelized notches can be moved to rear plane **5** and all other components follow in like manner. From Inner ring **1** being converted to front ring, channelized notch **4** being converted to channelized ring on the rear plane **5**, bearings **2** being converted to bearing on rear plane **5**, outer ring **3** being converted to rear ring on rear plane **5**, as well as channelized ring **6** being converted to channelized ring on rear plane **5**.

[0046] FIG. 8 shows depiction of one embodiment of the present invention. FIG. 8 shows a complete bracket assembly comprised of all entities with speaker FIG. 5. This includes the internal ring **2** of FIG. 6 that houses the

speaker unit FIG. 5. The Speaker unit fits on front plane of said internal ring. Also shown is an internal ring having holes **5** FIG. 6 that align with speaker holes **1** FIG. 5. With these alignments a nut and bolt assembly can be accepted from face plane of speaker FIG. 5 callout (**1**) through internal bracket FIG 6 callout (**5**). The nut and bolt assembly will slip through said holes **1** of FIG. 5 and enter holes on inner ring **5** of FIG 6. The nut attaches to bolt on the rear plane for ridged and firm placement on inner ring FIG. 6 callout (**2**) front plane. After speaker unit FIG. 5 is in place inner brackets is surrounded by bearings FIG. 6 callout (**3**). Bearings sit primed in channelized notches FIG. 7 callout (**4**,**6**) along the outer perimeter of inner ring FIG. 7 callout (**1**). Bearings FIG. 6 callout (**3**) then fits along another channelized path along inner perimeter of outer ring FIG. 7 callout (**3**). As illustrated in FIG. 6, inner ring **2** allows interior speaker to move by its own kinetic energy generated by sound input /output. The inner bracket **2** can be firmly mounted with nut and bolt assembly, screw type assembly, or other attachment to the speaker. Interior bracket FIG. 6 callout (**2**) and speaker unit FIG. 5 can sustain suspension by using exploiting bearings 2 in channelized notch **6** for support. Making interior ring FIG. 6 callout (**2**) operate on variable gyrating axis when power is applied to speaker.

[0047] "Enclosure" includes closed or open, synthetic or wood housing. Per detail description above, much emphasis was not made on enclosure type, size or shape because the gyrating bracket is made as an add-on supplemental kit. Therefore, the presently disclosed speaker bracket can be used with a wide variety of enclosures of different sizes and shapes while achieving kinetic movements from the speaker when amplification or typical stereo system applies power.

[0048] Environment was also not taken into account due to bracket being an add-on supplemental kit. This means that enclosure calculations are not

needed on pre-existing speaker/enclosure systems. And after enclosure specs on new systems have been calculated then the kit installation can begin.

[0049] Kinetic energy generally means power or force exerted to speaker system that allows the speaker, woofer, sub-woofer, or any acoustical replicator to vibrate. Vibration then allows unit to spin or be agitated when music is played being and bearings allow the speaker to move.

[0050] Acoustical replicator generally means speaker unit, or any speaker unit that generates audio sounds via electronic signals processed and reproduces as known as sound.

[0051] It is therefore intended that the foregoing detailed description be regarded as illustrative rather than limiting, and that it be understood that it is the following claims, including all equivalents, that are intended to define the spirit and scope of this invention.